

**ABSTRACT**

This invention seeks to provide methods and apparatus for analysis. Electromagnetic radiation is transmitted through a plurality of metallic islands on a transparent substrate. A resultant optical property of the plurality of metallic islands is measured. Thereafter a chemical substance is adsorbed onto the plurality of metallic islands so as to produce a chemical substance-metallic islands moiety.

Electromagnetic radiation is transmitted through the chemical substance-metallic islands moiety and a resultant optical property of metallic islands in the chemical substance-metallic islands moiety is measured. The resultant optical property of the metallic islands in chemical substance-metallic islands moiety and the resultant optical property of the plurality of metallic islands are employed so as to provide at least one of a quantitative indication and a qualitative indication of at least one of: the chemical substance-metallic islands moiety, a functionality of the chemical substance-metallic islands moiety, the plurality of metallic islands, a functionality of the plurality of metallic islands, the chemical substance and a functionality of the chemical substance.

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